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10/593,004	09/14/2006	Tomoyuki Ando	SHIGA7.056APC	6973

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EXAMINER

LEE, SIN J

ART UNIT	PAPER NUMBER
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1795

NOTIFICATION DATE	DELIVERY MODE
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03/05/2009

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/593,004	Applicant(s) ANDO, TOMOYUKI	
	Examiner Sin J. Lee	Art Unit 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 26 November 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 14 September 2006 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☒ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>11/21/2008</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

1. In view of the amendment, previous 112, second paragraph rejection on claim 3 is hereby withdrawn.
2. In view of the amendment, previous 102(b)/103(a) rejection over Gronbeck et al'899 is hereby withdrawn. Gronbeck does not teach or suggest present combinations listed in claim 1 for the photoacid generator component and the crosslinking agent component.
3. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Claim Objections

4. Claim 3 is objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is

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required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Present claim 2, from which present claim 3 depend, requires the presence of the unit (a3). Yet, in present claim 3, applicants recite that the unit (a3) can be present in the amount of 0-20 mol% (i.e., the unit does not have to be present). Thus, claim 3 fails to further limit the subject matter of present claim 2.

Claim Rejections - 35 USC § 103

5. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

6. Claims 1-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lin et al (US 6,340,734 B1).

In Example 4, Lin teaches poly(4-hydroxyphenylethylsilsesquioxane-co-**cyclohexyl**silsesquioxane) having Mw of 6,700. This polymer fits the generic formula (1) as taught by Lin in col.4, lines 52-67, col.5, lines 1-67, col.6, lines 1-4. Lin teaches (see col.5, lines 29-54) the equivalence of the cyclohexyl group and a phenyl group as the R₂ group in the formula (1). It would have been obvious to one skilled in the art to replace the cyclohexyl group with a phenyl group in Lin's polymer in Example 4 with a reasonable expectation of success. Such polymer teaches present resin (A) having a repeat unit of formula (I) and a repeat unit of formula (II).

In Lin's formula (1), the first repeat unit (such as the 4-hydroxyphenylethylsilsesquioxane unit) is present in the amount of 5-100 mol% (which gives 0-95 mol% for the second repeat unit) (see col.6, lines 5-7). Since these ranges

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overlap with present ranges for (a1) and (a2) units, the prior art's teaching renders present ranges prima facie obvious. In the case "where the [claimed] ranges overlap or lie inside ranges disclosed by the prior art," a prima facie case of obviousness would exist which may be overcome by a showing of unexpected results, *In re Wertheim*, 541 F.2d 257, 191 USPQ 90 (CCPA 1976).

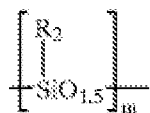
Lin teaches a negative photoresist composition containing his silsesquioxane polymer, a crosslinking component and a photoacid generator (see col.7, lines 60-63, col.8, lines 35-36). As examples for the photoacid generators, Lin includes onium salts (see col.11, lines 52-65) such as sulfonium salts and diaryliodonium salts. Lin also teaches that preferred crosslinking agents are glycoluril compounds (col.10, lines 61-66). Specifically, in a working example (see Example 10), a combination of di(*t*-butylphenyl)iodonium perfluorooctanesulfonate (present onium salt containing a fluorinated alkylsulfonic acid ion as an anion) and tetramethoxymethyl *glycoluril* is exemplified. It would have been obvious to one skilled in the art to use such combination (as exemplified in Example 10) in Lin's negative photoresist composition containing his silsesquioxane polymer as discussed above with a reasonable expectation of obtaining improved silsesquioxane-containing photoresist compositions which can be processed at higher temperatures.

Lin teaches (col.12, lines 13-16) that his photoresist composition can also include an organic base additives. Lin also teaches that his photoresist composition is especially useful as imaging layers in multilayer photolithographic processes (see col.12, lines 48-50 and col.13, lines 7-35 (see also Example 6))) and that his

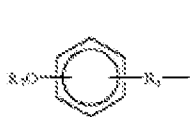
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composition can be patterned using electron beam (see col.12, lines 52-56). Thus, Lin's teaching renders obvious present inventions of claims 1, 4-6 and 9. Also, since Lin teaches present negative resist composition of claim 1, it is the Examiner's position that Lin's negative resist composition as discussed above would inherently be capable of being used in a magnetic film pattern forming method as recited in present claims 7 and 8. Thus, Lin's teaching also renders obvious present inventions of claims 7 and 8.

With respect to present claims 2 and 3, Lin teaches that his silsesquioxane polymers may contain a **plurality of different** R2 structures on the same polymer (see col.6, lines 1-4). The R2 group in the generic formula (1) is preferably selected from structures (3) to (6) shown in col.5, lines 32-54. Based on this teaching, it would have been obvious to one skilled in the art to *further include* the repeat unit



in which R2 is (3) as shown below



(3)

(where R7 is an alkyl group of at least one carbon atom and R4 is an alkylene group of at least one carbon atom) in Lin's polymer as discussed above with a reasonable expectation of obtaining improved silsesquioxane-containing photoresist compositions which can be processed at higher temperatures. Thus, Lin's teaching renders obvious present inventions of claims 2 and 3.

7. Claims 1-4 and 6-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirayama et al (JP 2004-341479) with its English equivalent, Hirayama et al (US 2005/0282090 A1).

The US document, Hirayama et al'090, is being used here merely for English translation of the Japanese document. In Example 4 (see also Reference Example 3), Hirayama teaches a composition containing (i) a copolymer (Mw of 7,000) consisting of 50 mol% of (p-hydroxybenzyl)silsesquioxane units, 22 mol% of p-methoxybenzyl silsesquioxane units and 28 mol% of phenyl silsesquioxane units, (ii) a photoacid generator shown in [0060] of the US document and a crosslinking agent (C1) shown in [0062] of the US document (present glycoluril-based crosslinking agent). The photoacid generator shown in [0060] (i.e., 7,7-dimethyl-bicyclo-[2,2,1]-heptan-2-on-1-sulfonate of bis(p-tert-butylphenyl)iodonium) is taught by Hirayama to be equivalent to triphenylsulfonium trifluoromethanesulfonate and triphenylsulfonium nonafluorobutanesulfonate as particularly preferable examples of photoacid generator to be used in his invention (see [0027] of US document). Thus, it would have been obvious to one skilled in the art to use triphenylsulfonium trifluoromethanesulfonate or triphenylsulfonium nonafluorobutanesulfonate in Hirayama's Example 4 with a reasonable expectation of success. Thus, Hirayama renders obvious present inventions of claims 1, 2, 4 and 6-9 (since Hirayama teaches present components of claim 1, Hirayama's composition as discussed above would inherently be capable of being used as a negative resist composition as presently recited and also would inherently be capable of being used in those methods as recited in present claims 6-9).

With respect to present claim 3, as discussed above, Hirayama's copolymer used in Example 4 contains 22 mol% of p-methoxybenzyl silsesquioxane unit. This value is close enough to the higher end of the present range (0-20mol%) for the unit (a3) that a prima facie case of obviousness exists for present range. Where the claimed ranges and prior art do not overlap but are close enough that one skilled in the art would have expected them to have the same properties, a prima facie case of obviousness would exist which may also be overcome by a showing of unexpected results, In re Titanium Metals Corporation of America v. Banner, 227 USPQ 773 (Fed. Cir. 1985). Thus, Hirayama's teaching renders obvious present invention of claim 3.

Response to Arguments

8. Applicants argue unexpected superior results of using present resin containing both units (a1) and (a2) by pointing to the comparison between Example 3 and Comparative Example 1 of present specification. However, such argument is not found to be persuasive for the following reasons: Example 3 and Comparative Example 1 use *two different* photoacid generators. Also, Example 3 is not using the presently required combination of an onium salt containing a fluorinated alkylsulfonic acid ion as an anion and a glycoluril-based or melamine-based crosslinking agent (instead, it is using the ethyleneurea-based crosslinking agent). Also, the comparison is not commensurate in scope with the broadest claim because those examples are using additives (including the nitrogen-containing organic compound claimed in dependent claim 5) which are not being claimed in present claim 1.

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9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Sin J. Lee whose telephone number is 571-272-1333. The examiner can normally be reached on Monday-Friday from 9:00 am EST to 5:30 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia Kelly, can be reached on 571-272-1526. The fax phone number for the organization where this application or proceeding is assigned is **571-273-8300**.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Sin J. Lee/
Primary Examiner, Art Unit 1795
February 28, 2009